AEROSPACE MATERIAL SPECIFICATION

AMS7713™	REV. C

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Stabilized	2016-01

Superseding AMS7713B

Iron, Electrical, Bar and Strip
Cold Finished, Annealed

RATIONALE

AMS7713C stabilizes this document because this document is no longer state of the art and other documents contain similar but not necessarily equivalent requirements.

STABILIZED NOTICE

AMS7713C has been declared "STABILIZED" by the SAE AMS E Carbon and Low Alloy Steels Committee. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because this document is no longer state of the art and other documents contain similar but not necessarily equivalent requirements. Previously this document was NonCurrent, effective September 2006. The last technical update of this document occurred in December 1995. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification, including exceptions listed on the certification.

NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

SAE AMS Committee E recommends that the following similar but not identical specifications may be considered for future procurement. This listing does not constitute authority to substitute these specifications for the “STABILIZED” specification.

ASTM A848 Type 1, Standard Specification for Low-Carbon Magnetic Iron

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS7713C

1. SCOPE:

1.1 Form:

This specification covers electrical iron in the form of bar and strip.

1.2 Application:

These products have been used typically for parts in direct current devices requiring electrical conductivity, high permeability and saturation, and low magnetic retentivity after fabrication by forming or deep drawing followed by annealing in wet hydrogen, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2251	Tolerances, Low-Alloy Steel Bars
MAM 2251	Tolerances, Metric, Low-Alloy Steel Bars
AMS 2252	Tolerances, Low-Alloy Steel Sheet, Strip, and Plate
MAM 2252	Tolerances, Metric, Low-Alloy Steel Sheet, Strip, and Plate
AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock
AMS 2806	Identification Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat Resistant Steels and Alloys
AMS 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM A 341	Direct-Current Magnetic Properties of Materials Using D-C Permeameters and the Ballistic Test Methods
ASTM A 596	Direct-Current Magnetic Properties of Materials Using Ring Test Procedures and the Ballistic Methods
ASTM E 18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 350	Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron.

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 350, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.020
Manganese	--	0.15
Silicon	--	0.15
Phosphorus	--	0.020
Sulfur	--	0.015
Chromium	--	0.30
Nickel	--	0.20
Vanadium	0.04	0.10
Iron	remainder	

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition:

Cold finished and annealed (See 8.2).

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Hardness: Shall be as follows, determined in accordance with ASTM E 18:

3.3.1.1 Bars: Not higher than 65 HRB, or equivalent (See 8.3).

3.3.1.2 Strip: Not higher than 55 HRB, or equivalent (See 8.3).

3.3.2 Coercive Force: Shall not exceed 1.3 oersted (103 ampere/meter) at 15,000 guass (1.5 tesla) after annealing by heating to 1560 °F ± 25 (849 °C ± 14) in a wet hydrogen atmosphere, holding at heat for 4 hours ± 0.25, and cooling at a rate of 100 to 180 F (56 to 100 C) degrees per hour to below 1025 °F (552 °C), and at any rate thereafter. Test specimens shall be machined to size prior to annealing.

3.3.2.1 Bars With Nominal Diameter Over 1.250 Inches (31.75 mm) and Strip: Coercive force shall be determined in accordance with ASTM A 596. The rings shall have an effective ratio of mean diameter to radial width of not less than 5 to 1 and the cross section of the test specimen shall be not less than 0.250 inch (6.35 mm).

3.3.2.2 Bars With Nominal Diameter 1.250 Inches (31.75 mm) and Under: Shall be tested using a permeameter in accordance with ASTM A 341.

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall be as follows:

3.5.1 Bars: In accordance with AMS 2251 or MAM 2251.

3.5.2 Strip: In accordance with AMS 2252 or MAM 2252.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2370 and the following:

4.3.1 Coercive Force: At least one piece from each lot.